

Claims

1. Method for providing location assistance information to a mobile station of a communications network, the method comprising the steps of:

- estimating visibilities of a plurality of satellites with respect to the mobile station, said plurality of satellites being satellites of a satellite positioning system,
- selecting a group of said plurality of satellites with the best estimated visibilities with respect to the mobile station, and
- sending to the mobile station location assistance information relating to at least said group of satellites.

2. A method as defined in claim 1, wherein said group of satellites contains a predetermined number of satellites.

3. A method as defined in claim 1 or 2, wherein location assistance information relating to said group of satellites is sent in one location assistance message.

4. A method as defined in claim 1 or 2, wherein location assistance information relating to said group of satellites is sent using a plurality of location assistance messages, each location assistance message of said plurality of location assistance messages containing information about one satellite of said satellite positioning system.

5. A method as defined in any preceding claim, wherein location assistance information relating to said group of satellites is sent in response to receipt of a location assistance information request from the mobile station.

6. A method as defined in any one of claims 1 to 4, wherein location assistance information relating to said group of satellites is sent periodically.

7. A method as defined in any preceding claim, wherein location information relating to said group of satellites is sent in an order dependent on the estimated visibilities with respect to the mobile station.

8. A method as defined in claim 1, further comprising the steps of selecting a further group of satellites with the next best estimated visibilities with respect to the mobile station.

9. A method as defined in claim 8, wherein location assistance information relating to said group of satellites is sent to the mobile station before location assistance information relating to said further group of satellites.

10. A method as defined in claim 8 or 9, wherein location assistance information relating to said group of satellites is sent in a first location assistance message and location assistance information relating to said further group of satellites is sent in a second location assistance message.

11. A method as defined in claim 8 or 9, wherein location assistance information is sent using a plurality of location assistance messages, each location assistance message of said plurality of location assistance messages containing information about one satellite of said satellite positioning system.

12. A method as defined in any one of claims 8 to 11, wherein location assistance information relating to said group of satellites is sent in response to receipt of a location assistance information request from the mobile station.

13. A method as defined in claim 12, wherein location assistance information relating to said further group of satellites is sent to the mobile station upon a request for location assistance information relating to said further group.

14. A method as defined in any one of claims 8 to 11, wherein location assistance information relating to said group of satellites is sent periodically.

15. A method as defined in claim 14, wherein location assistance information relating to said further group of satellites is sent as often as location assistance information relating to said group of satellites.

16. A method as defined in claim 14, wherein location assistance information relating to said further group of satellites is sent less often than location assistance information relating to said group of satellites.

17. A method as defined in any one of claims 8 to 16, wherein location information relating to said group of satellites and to said further group of satellites is sent in an order dependent on the estimated visibilities with respect to the mobile station.

18. A method as defined in any preceding claim, wherein said group of satellites contains three or four satellites of the satellite positioning system.

19. A method as defined in any preceding claim, further comprising the step of estimating visibilities of the satellites based on elevation angles of the satellites with respect to an estimated location of the mobile station.

20. A method as defined in claim 19, wherein obstructions in the vicinity of the estimated location of the mobile station are taken into account in estimating visibilities of the satellites with respect to the mobile station.

21. A method as defined in any preceding claim, wherein said location assistance information is for a mobile-assisted location method.

22. A method as defined in any one of claims 1 to 20, wherein said location assistance information is for a mobile-based location method.

23. A network element for providing location assistance information to a mobile station of a communications network, the network element being configured to
 estimate visibilities of a plurality of satellites with respect to a mobile station, said satellites being satellites of a satellite positioning system,
 select a group of said plurality of satellites with the best estimated visibilities with respect to the mobile station, and
 send to a mobile station location assistance information relating to at least said group of satellites.

24. A network element as defined in claim 23, further configured to receive location assistance information relating to satellites of said satellite positioning system.

25. A network element as defined in claim 23 or 24, wherein the network element is a location server.

26. A communications system for providing location assistance information, comprising

- at least one reference receiver of a satellite positioning system for obtaining location assistance information relating to satellites of the satellite positioning system,
- means for estimating visibilities of a plurality of satellites of the satellite positioning system with respect to a mobile station,
- means for selecting a group of said plurality of satellites with the best estimated visibilities with respect to the mobile station, and
- means for sending to the mobile station location assistance information relating to said group of satellites.

27. A communications system as defined in claim 26, wherein said means for estimating visibilities of satellites with respect to the mobile station are provided in a location server.

28. A communications system as defined in claim 26, wherein said means for estimating visibilities of satellites with respect to the mobile station are provided in a number of network elements.